Wireless LAN Access Point
WLA522 and WLA522E
Quick Start Guide

Part Number: 530-042353 Rev.01

This guide provides basic hardware installation instructions for Juniper Networks WLA Series Indoor Wireless LAN Access Point (AP) WLA522 and WLA522E models.

Informational Note: The following product SKUs limit channel set and transmit power range to the specified country/domain:
WLA522-US (United States)
WLA522-IL (Israel)
WLA522-WW (Worldwide)
WLA522E-US (United States)
WLA522E-IL (Israel)
WLA522E-WW (Worldwide)

Warning: Installation must be performed by qualified service personnel only. Read and follow all warning notices and instructions marked on the product or included in the documentation. Before installing the product, read the rest of this document.

Warning: Waarschuwing! De installatie mag alleen worden uitgevoerd door bevoegd onderhoudspersoneel. Het is essentieel dat u kennis neemt van alle waarschuwingen en instructies aangebracht op het product zelf en/of opgenomen in de documentatie. Voordat u het product installeert, dient u dit document in zijn geheel te hebben gelezen.

Warning: Warnung! Die Installation darf nur von qualifiziertem Servicepersonal vorgenommen werden. Lesen und befolgen Sie alle Warnhinweise und -anleitungen auf dem Produkt bzw. in der Dokumentation. Lesen Sie vor Installation des Produkts den restlichen Teil dieses Dokuments.

Warning: Avertissement! L'installation ne peut être effectuée que par un personnel qualifié. Lisez et suivez tous les messages d'avertissement et les instructions inscrits sur le produit ou inclus dans la documentation. Avant d'installer le produit, lisez le reste de ce document.

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Warning: Attenzione! L'installazione deve essere effettuata unicamente da personale qualificato. Leggere e rispettare tutte le segnalazioni di attenzione e le istruzioni indicate sul prodotto o incluse nella documentazione. Prima d'installare il prodotto, leggere tutto il documento.

Warning: ¡Advertencia! La instalación debe realizarse exclusivamente por parte de personal de servicio cualificado. Lea y siga todas las notas de advertencia e instrucciones en el producto o la documentación. Antes de instalar el producto deberá leer la parte restante del presente documento.

Warning: ¡Advertencia! A instalação dever ser realizada exclusivamente por pessoal de serviço qualificado. Leia e siga todas as notas de advertência e instrucões no produto ou na documentação. Antes de instalar o produto deverá ler a parte restante do presente documento.

Warning: Varning! Installation får endast utföras av kvalificerad servicepersonal. Läs och följ alla varningsmeddelanden och instruktioner markerade på produkten eller inkluderade i dokumenteringen. Innan produkten installeras skall resten av dessa dokument läsas.

Warning: Advarsel! Installation må kun gennemføres af faglært servicepersonale. Læs, og følg alle de advarselsmeddelelser og anvisninger, der er anført på produktet eller i dokumentationen. Læs resten af dette dokument før installation af produktet.

Warning: Advarsel! Installasjon skal kun utføres av kvalifisert service personell. Les og følg alle varsels meldinger og instrukssjons merkinger på produktet og i veiledningen. Les resten av denne veiledningen før produktet installeres.

Warning: Varoitus! Installatie dient uitsluitend plaats te vinden door bevoegde monteurs. Lees alle waarschuwingen en instructies die op het product zijn aangegeven of in de documentatie zijn opgenomen, en volg deze op. Lees voordat u het product installeert eerst de rest van dit document.

Warning: Viðvörun! Aðeins hæfir þjónustufulltrúar mega sinna uppsetningu tækjanna. Lesið og fylgið öllum viðvörunum og leiðbeiningum í þessum gögnum. Lesið restina af þessum gögnum fyrir uppsetningu.

Warning:

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Warning:

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Warning:

تحذير! يجب أن يقوم بأعمال التركيب أفراد الصيانة المؤهلين دون غيرهم. اقرأ واتبع كافة الملاحظات والإرشادات التحذيرية الموضحة على المنتج أو المدرجة في الوثائق المصاحبة. اقرأ الأجزاء المتبقية من المستند قبل تركيب المنتج.

For detailed compliance information see the Juniper Networks Regulatory Guide and the Juniper Networks Indoor Wireless Lan Access Point Installation Guide located at: http://www.juniper.net/. The guides can be downloaded in PDF format.

Warning: Always install the four WLA522E antennas before supplying power to the AP. Failure to do so can cause damage to the unit.

Warning: The operation of antenna WLA-ANT5007-OUT is not allowed in India.

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Installing and Connecting a WLA

Informational Note: Before installing an AP, you might need to generate a network plan and an AP work order with RingMaster. (See RingMaster Network Plan and Work Orders below.)

Installation Requirements and Recommendations

For best results, follow these requirements and recommendations before installing a WLA.

RingMaster Network Plan and Work Orders

If you are using RingMaster to plan your Juniper Networks Mobility System installation, you might want to create and verify a network plan for the entire Juniper Networks installation and generate an AP work order before installation. A network plan and the AP work orders generated from it provide the following information about AP installation and configuration:

- Number of APs required for adequate WLAN capacity in each coverage area
- Detailed installation location for each AP
- Settings for all APs in the WLAN

Informational Note: System Administrators and equipment installers of the WLAN System are responsible for the proper setup and operation in accordance to all rules and regulations of the country in which the equipment operates.

Wireless Lan Controller (WLC) Appliance Recommendation

Juniper Networks recommends that you install and configure the WLC before installing an AP. If the WLC is already installed and configured for the APs, you can immediately verify the cable connection(s) when you plug the cable(s) into the AP.

Warning: An Indoor AP is designed to receive power only from an 802.3af-compliant source, a Juniper WLC, or a Juniper Networks-approved power injector. Connecting an AP to a Power over Ethernet (PoE) device not approved by Juniper Networks can damage the equipment.

Wall Installation Recommendations

If you plan to install the AP on a partial wall or other vertical surface, orient the top of the AP (the side with the LEDs) toward the intended coverage area. The radio antennas transmit through the top of the AP but not through the bottom, where the bracket is located.

This recommendation does not apply if you are installing the WLA522E. Orient the antennas as shown in WLA522E Installation Antenna Orientation on page 32.

AP Radio Safety Advisories

When you enable the AP radio(s) as part of WLC configuration, the radios can receive and transmit radio frequency energy as soon as you connect the AP to the WLC, either directly or through the network.

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Radio Frequency Exposure

Federal Communications Commission (FCC) Docket 96-8 for Spread Spectrum Transmitters specifies a safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC-certified equipment. When used with Juniper-approved antennas, Juniper Networks APs meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1-1991. Proper installation of the AP according to the instructions in this manual will result in user exposure that is below the FCC recommended limits.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Warning: FCC and IC Radiation Exposure Statement

This equipment complies with FCC and IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 50cm (19.7 inches) between the radiator and your body.

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Warning: FCC Notice for the WLA522E:
For indoor operations:
Devices will not permit operations on channels 120-132 for 11a and 11n/a which overlap the 5600 - 5650 MHz band.
For outdoor operations:
In order to meet new FCC, NTIA, FAA and industry restrictions to resolve interference to Terminal Doppler Weather Radar (TDWR) systems used at airports, any outdoor device installed within 35 km of a TDWR location must be separated by at least 30 MHz (center-to-center) from TDWR operating frequency (as shown in the table below). Channels 120-132 and 5600-5650 MHz band are disabled on any antennaes located outdoors.

Warning: Juniper Networks recommends that all operators and installers register the location information of the UNII devices operating outdoors in the 5470 – 5725 MHz band within 35 km of any TDWR location at the WISPA sponsored database (http://www.spectrumbridge.com/udia/home.aspx). This database may be used by government agencies in order to expedite resolution of any interference to TDWRs.

Warning: Procedures on how to register the devices in the industry-sponsored database with the appropriate information regarding the location and operation of the device and installer information can be found on the database.

Table 1: TDWR Location Information

State	City	Longitude	Latitude	Frequency	Terrain Elevation (MSL) [ft]	Antenna Height Above Terrain [ft]
AZ	Phoenix	W 112 09 46	N 33 25 14	5610 MHz	1024	64
CO	Denver	W 104 31 35	N 39 43 39	5615 MHz	5643	64
FL	Ft. Lauderdale	W 080 20 39	N 26 08 36	5645 MHz	7	113
FL	Miami	W 080 29 28	N 25 45 27	5605 MHz	10	113
FL	Orlando	W 081 19 33	N 28 20 37	5640 MHz	72	97
FL	Tampa	W 082 31 04	N 27 51 35	5620 MHz	14	80
FL	West Palm Beach	W 080 16 23	N 26 41 17	5615 MHz	20	113
GA	Atlanta	W 084 15 44	N 33 38 48	5615 MHz	962	113
IL	McCook	W 087 51 31	N 41 47 50	5615 MHz	646	97
IL	Crestwood	W 087 43 47	N 41 39 05	5645 MHz	663	113
IN	Indianapolis	W 086 29 08	N 39 38 14	5605 MHz	751	97
KS	Wichita	W 097 26 13	N 37 30 26	5603 MHz	1270	80
KY	Covington Cincinnati	W 084 34 48	N 38 553 53	5601 MHz	942	97
KY	Louisville	W 085 36 38	N 38 02 45	5646 MHz	617	113
LA	New Orleans	W 090 24 11	N 30 01 18	5645 MHz	2	97
MA	Boston	W 070 56 01	N 42 09 30	5610 MHz	151	113
MD	Brandywine	W 076 50 42	N 38 41 43	5635 MHz	233	113
MD	Benfield	W 076 37 48	N 39 05 23	5645 MHz	184	113
MD	Clinton	W 076 57 43	N 38 45 32	5615 MHz	249	97
MI	Detroit	W 083 30 54	N 42 06 40	5615 MHz	656	113
MN	Minneapolis	W 092 55 58	N 44 52 17	5610 MHz	1040	80
MO	Kansas City	W 094 44 31	N 39 29 55	5605 MHz	1040	64

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State	City	Longitude	Latitude	Frequency	Terrain Elevation (MSL) [ft]	Antenna Height Above Terrain [ft]
MO	Saint Louis	W 090 29 21	N 38 48 20	5610 MHz	551	97
MS	Desoto County	W 089 59 33	N 34 53 45	5610 MHz	371	113
NC	Charlotte	W 080 53 06	N 35 20 14	5608 MHz	757	113
NC	Raleigh Durham	W 078 41 50	N 36 00 07	5647 MHz	400	113
NJ	Woodbridge	W 074 16 13	N 40 35 37	5620 MHz	19	113
NJ	Pennsauken	W 075 04 12	N 39 56 57	5610 MHz	39	113
NV	Las Vegas	W 115 00 26	N 36 08 37	5645 MHz	1995	64
NY	Floyd Bennett Field	W 073 52 49	N 40 35 20	5647 MHz	8	97
OH	Dayton	W 084 07 23	N 40 01 19	5640 MHz	922	97
OH	Cleveland	W 082 00 28	N 41 17 23	5645 MHz	817	113
OH	Columbus	W 082 42 55	N 40 00 20	5605 MHz	1037	113
OK	Aero. Ctr TDWR #1	W 097 37 31	N 35 24 19	5610 MHz	1285	80
OK	Aero. Ctr TDWR #2	W 097 37 43	N 35 23 34	5620 MHz	1293	97
OK	Tulsa	W 095 49 34	N 36 04 14	5605 MHz	712	113
OK	Oklahoma City	W 097 30 36	N 35 16 34	5603 MHz	1195	64
PA	Hanover	W 080 29 10	N 40 30 05	5615 MHz	1266	113
PR	San Juan	W 066 10 46	N 18 28 26	5610 MHz	59	113
TN	Nashville	W 086 39 42	N 35 58 47	5605 MHz	722	97
TX	Houston Intercontinental	W 095 34 01	N 30 03 54	5605 MHz	154	97
TX	Pearland	W 095 14 30	N 29 30 59	5645 MHz	36	80
MN	Minneapolis	W 092 55 58	N 44 52 17	5610 MHz	1040	80
MO	Kansas City	W 094 44 31	N 39 29 55	5605 MHz	1040	64
MO	Saint Louis	W 090 29 21	N 38 48 20	5610 MHz	551	97
MS	Desoto County	W 089 59 33	N 34 53 45	5610 MHz	371	113
NC	Charlotte	W 080 53 06	N 35 20 14	5608 MHz	757	113
NC	Raleigh Durham	W 078 41 50	N 36 00 07	5647 MHz	400	113
NJ	Woodbridge	W 074 16 13	N 40 35 37	5620 MHz	19	113
NJ	Pennsauken	W 075 04 12	N 39 56 57	5610 MHz	39	113
NV	Las Vegas	W 115 00 26	N 36 08 37	5645 MHz	1995	64
NY	Floyd Bennett Field	W 073 52 49	N 40 35 20	5647 MHz	8	97
OH	Dayton	W 084 07 23	N 40 01 19	5640 MHz	922	97
OH	Cleveland	W 082 00 28	N 41 17 23	5645 MHz	817	113
OH	Columbus	W 082 42 55	N 40 00 20	5605 MHz	1037	113
OK	Aero. Ctr TDWR #1	W 097 37 31	N 35 24 19	5610 MHz	1285	80
OK	Aero. Ctr TDWR #2	W 097 37 43	N 35 23 34	5620 MHz	1293	97
OK	Tulsa	W 095 49 34	N 36 04 14	5605 MHz	712	113
OK	Oklahoma City	W 097 30 36	N 35 16 34	5603 MHz	1195	64
PA	Hanover	W 080 29 10	N 40 30 05	5615 MHz	1266	113
PR	San Juan	W 066 10 46	N 18 28 26	5610 MHz	59	113
TN	Nashville	W 086 39 42	N 35 58 47	5605 MHz	722	97

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State	City	Longitude	Latitude	Frequency	Terrain Elevation (MSL) [ft]	Antenna Height Above Terrain [ft]
TX	Houston Intercontinental	W 095 34 01	N 30 03 54	5605 MHz	154	97
TX	Pearland	W 095 14 30	N 29 30 59	5645 MHz	36	80

Warning: FCC Caution for the WLA522E

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems.

The maximum antenna gain permitted (for devices in the bands 5250-5350 MHz and 5470-5725 MHz) to comply with the e.i.r.p. limit.

The maximum antenna gain permitted (for devices in the band 5725-5825 MHz) to comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate, as stated in section A9.2(3).

High-power radars are allocated as primary users (meaning they have priority) of the bands 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices.

Warning: IC Statement for the WLA522E- This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Warning: Cet appareil numérique de la classe B est conforme á la norme NMB-003 du Canada.

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Additional Radio Safety Advisories

Warning: In the U.S., locate the AP and any externally attached antennas a minimum of 50cm (19.7 inches) away from people. This safety warning conforms with FCC radio frequency exposure limits for dipole antennas such as those used in the AP.

Warning: Do not operate the AP near unshielded blasting caps or in an otherwise explosive environment unless the device has been modified for such use by qualified personnel.

Warning: Before using a wireless device in a hazardous location, consult the local codes, national codes, and safety directors of the location for usage constraints.

Warning: Do not touch or move the AP when the antennas are transmitting or receiving.

Warning: Do not hold any radio device so that the antenna is very close to or touching the face, eyes, or other exposed body part while the radio antenna is transmitting.

Cabling Requirements

Warning: Do not connect or disconnect cables or otherwise work with the AP hardware during periods of lightning activity.

Informational Note: The AP is intended for indoor use only. Do not install the device outdoors, unless you install it with a Juniper Networks outdoor AP enclosure.

Informational Note: To reduce the possibility of connection interference caused by dust, clean the Cat 5 connector pins before inserting a cable into an AP.

Category 5 cable with straight-through signaling must be installed at the site before you install an AP. A single connection requires one cable. A dual-homed connection requires two cables.

Mounting an AP on a solid surface requires Cat 5 cable that does not have strain relief. For installation on all other surfaces, use a Cat 5 cable with or without strain relief.

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Installing an Indoor AP

Installation Hardware and Tools

The table below lists the mounting hardware and tools required for AP installation.

Table 2: Required Mounting Hardware and Tools

Mounting Option	Required Hardware and Tools	Included with the Product
Suspended ceiling—flush ceiling tiles	Mounting template	Yes
	Universal mounting bracket	Yes
	T-bar clamp — A T-bar clamp is not required for a 23.9-millimeter (15/16-inch) T-bar ceiling with flush ceiling tiles.	Yes
	Box cutter	No
	Small screwdriver (3-millimeter or 1/8-inch)	No
	small-pointed instrument or a paperclip	No
Suspended ceiling—drop ceiling tiles	Mounting template	Yes
	Universal mounting bracket	Yes
	T-bar clamp	Yes
	Box cutter	No
	Small screwdriver (3-millimeter or 1/8-inch)	No
	small-pointed instrument or a paperclip	No
Junction box	Junction box	No
	Two #6-32 x 1-inch machine screws	Yes
	Universal mounting bracket	Yes
	Small screwdriver (3-millimeter or 1/8-inch)	No
	#2 Phillips-head screwdriver	No
	small-pointed instrument or a paperclip	No
Solid wall or ceiling	Two #6 sheet metal screws and two drywall anchors	Yes
	Universal mounting bracket	Yes
	Hammer	No
	Small screwdriver (3-millimeter or 1/8-inch)	No
	#2 Phillips-head screwdriver	No
	small-pointed instrument or a paperclip	No
Tabletop	Universal mounting bracket	Yes
	Small screwdriver (3-millimeter or 1/8-inch)	No
	small-pointed instrument or a paperclip	No

Informational Note: Indoor APs are UL2043 plenum rated, so it also can be installed in the space above the ceiling if preferred.

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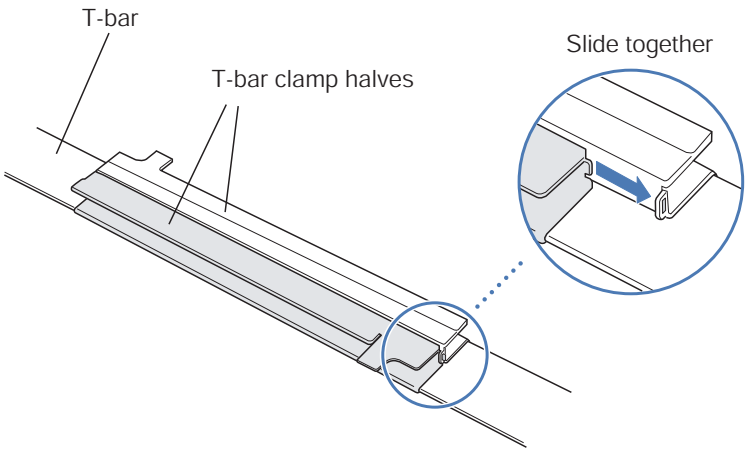
Installing an Indoor WLA522

Suspended Ceiling Installation — Flush Ceiling Tiles for the WLA522

1. Select an installation location centered over a T-bar in the ceiling.
2. Cut a hole as follows in the ceiling tile for the Cat 5 cable:
   a. Place the mounting template over the area where you plan to install the AP.
   b. Use the box cutter to cut along the line marking the opening for the port connectors.
   c. Remove the mounting template and the material you cut from the ceiling panel.
3. Determine whether to install a T-bar clamp onto the ceiling T-bar:
   a. If the T-bar width is 14.2 millimeter (9/16 inches), you need to install the 14.2-millimeter (9/16 inches) T-bar clamp. Go to step 4.
   b. If the T-bar width is 23.9 millimeter (15/16 inches), the universal mounting bracket fits directly onto the T-bar. Go to step 5.
4. Install the 14.2-millimeter (9/16-inch) T-bar clamp onto the ceiling T-bar as shown in Figure 1.
   a. Slide each half of the clamp onto the T-bar so that the clamp lip is fully on the T-bar.
   b. Slide the two halves of the clamp toward each other until the tabs are inserted completely into the holes and the clamp fits snugly on the T-bar.

Figure 1: Step 4—Installing a T-bar Clamp



5. Unlock the universal mounting bracket from the AP by inserting the lock/unlock tool into the **Unlock** hole on the AP as shown in Figure 2 below.

Caution: Use a small-pointed instrument or a paperclip to unlock the AP. Do not use a screwdriver because it may cause damage to the AP lock mechanism or electronic components. Do not use excessive force when inserting a tool into the **Unlock** or **Lock** hole.

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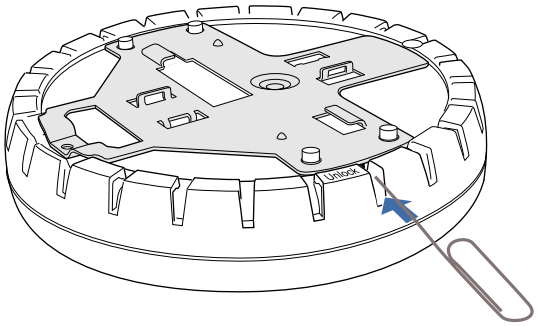
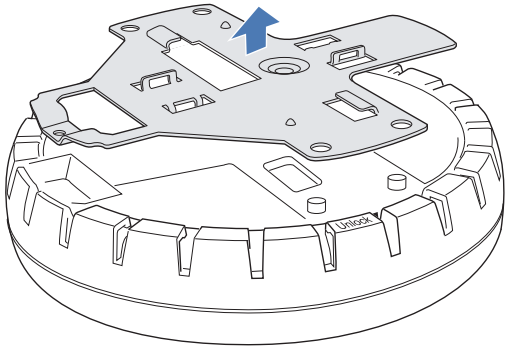
Figure 2: Step 5—Unlocking the Bracket



6. Remove the bracket as shown in Figure 3 below.

Figure 3: Step 6—Removing the Bracket



7. Install the universal mounting bracket as follows onto the T-bar or T-bar clamp.
   a. As shown in the Figure 4 below, place the universal mounting bracket against the T-bar or clamp so that the two screw holes face downward and the two T-bar flanges face upward and are adjacent to the T-bar edges.

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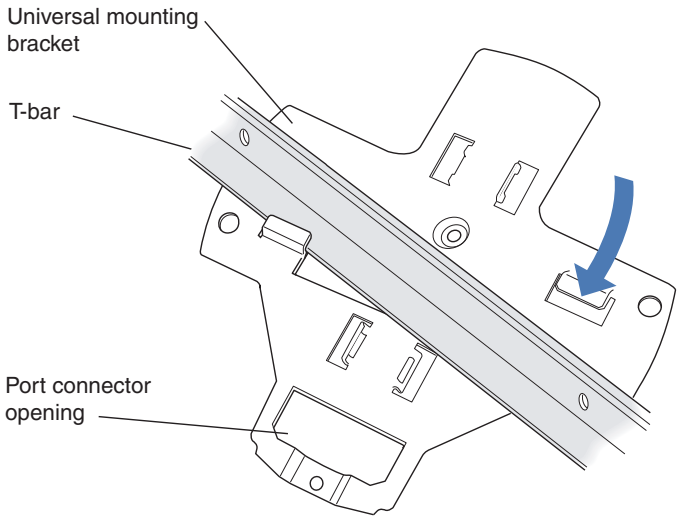
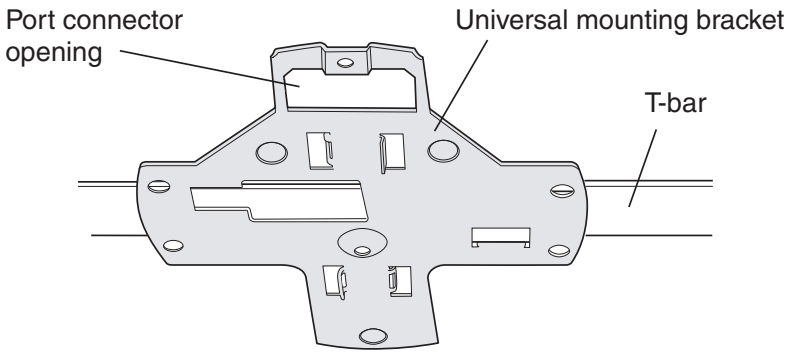
Figure 4: Step 7—Top View



b. Properly align the bracket for mounting by placing the bracket so the port connector opening is to the left of the hole you cut for the cables.

c. Rotate the universal mounting bracket clockwise until the flanges snap into place on the T-bar or clamp as shown in Figure 5 below.

Figure 5: Step 7—Bottom View



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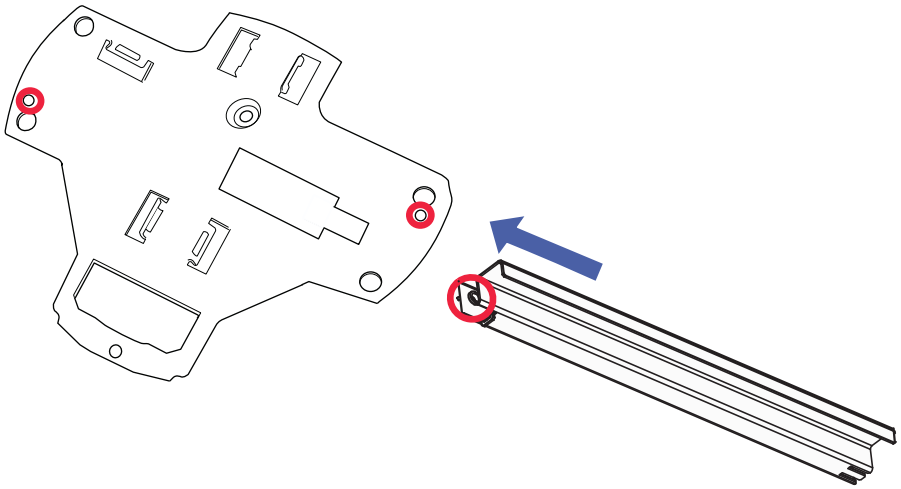
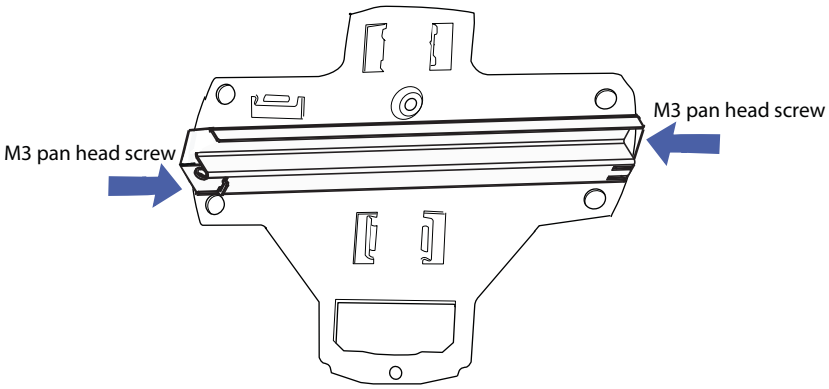
Informational Note: **WLA522-Specific Optional Earthquake Safety Step**
At this point, once you have the T-bar installed and the universal mounting bracket snapped into place, you have the option of securing the bracket for earthquake safety using the two supplied M3 pan head threaded screws.

Informational Note: Note that the T-bars and the universal mounting bracket in the WLA522 Installation Kit have two additional screw holes as shown below.



When the universal mounting bracket is snapped into place, the holes will align.
Screw the two M3 pan head threaded screws into the holes. The screws will hold the T-bar and universal mounting bracket together in the event of an earthquake. The WLA522 is then locked securely into place on the secured universal mounting bracket.



8. Pull the Cat 5 cable about 15 centimeters (about 6 inches) out of the hole in the ceiling tile and through the port connector opening to create enough slack to insert the cable.
9. Insert the Cat 5 cable into the connector.
10. Install the Kensington lock, if you plan to use one.

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a. Loop the Kensington lock cable around an object that cannot be moved or damaged by a person pulling on the cable.

b. Insert the key into the Kensington lock.

c. Insert the Kensington lock into the security slot on the AP.

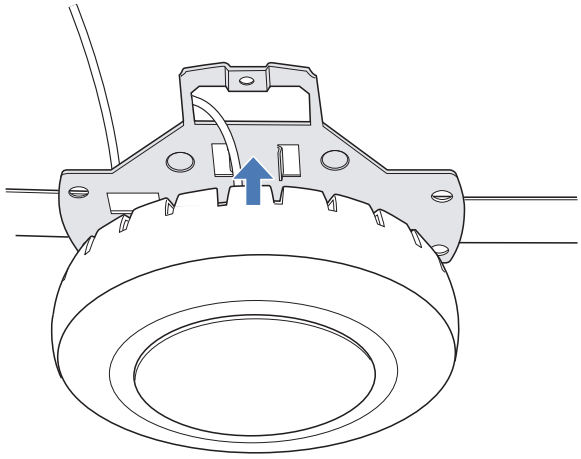
d. Rotate the key right or left to secure the lock to the AP.

e. Pull on the lock to verify that it is secured to the AP.

f. Remove the key.

11. Lift the AP into place on the universal mounting bracket as shown in Figure 6 below. Make sure the cable feeds properly into the ceiling as you lift the device, and does not become trapped between the AP and the bracket.

Figure 6: Step 10—Placing the AP on the Bracket



12. Lock the AP onto the bracket by inserting a small-pointed instrument or a paperclip into the **Lock** hole on the AP as shown in Figure 7 below.

Warning: To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

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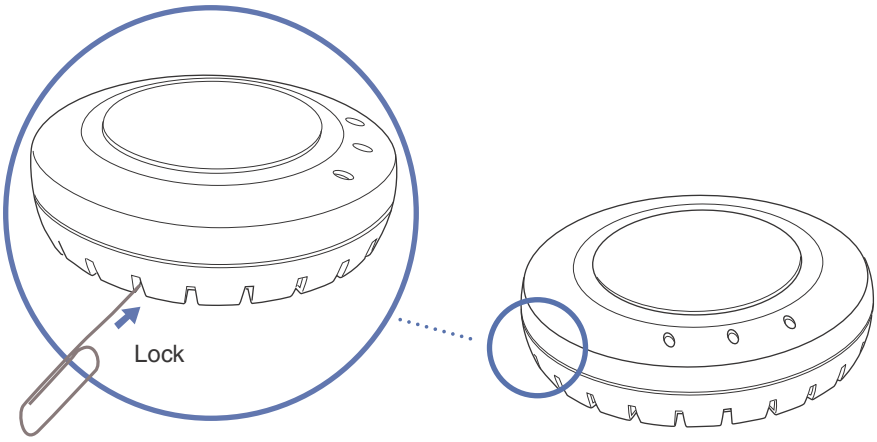
Figure 7: Step 12—Locking the Bracket



13. To ensure that the AP is fully locked onto the bracket, gently pull down on the AP and attempt to rotate it from side to side.
14. If the AP comes off the bracket, relock the device onto the bracket as described in step 12.
15. If the AP requires an external antenna, install and connect the antenna.

Suspended Ceiling Installation—Drop Ceiling Tiles

1. Select an installation location that is centered over a T-bar in the ceiling.
2. Cut a hole as follows in the ceiling tile for the Cat 5 cable:
   a. Place the mounting template over the area where you plan to install the AP.
   b. Use the box cutter to cut along the line marking the opening for the port connectors.
   c. Remove the mounting template and the material you cut from the ceiling panel.
3. Install the T-bar clamp that fits the T-bar:
   a. Slide each half of the clamp onto the T-bar so that the clamp lip is fully on the T-bar.
   b. Slide the two halves of the clamp toward each other until the tabs are inserted completely into the holes and the clamp fits snugly on the T-bar.

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Figure 8: Step 3—Installing the T-bar Clamp for a 23.9-millimeter (15/16-inch) T-bar

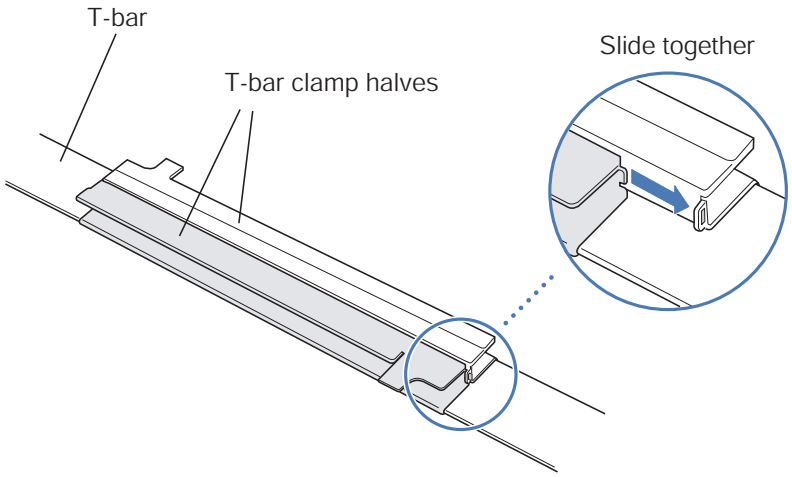
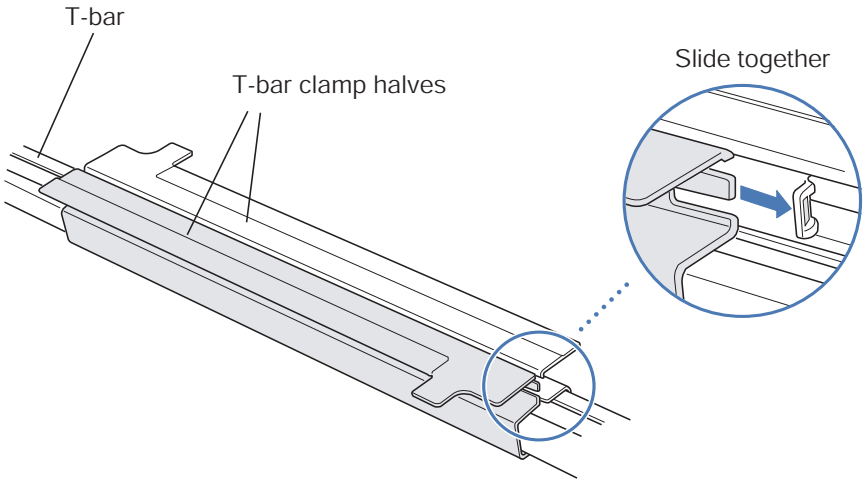


Figure 9: Step 3—Installing the T-bar Clamp for a 15.9-millimeter (5/8-inch) T-bar



4. Unlock the universal mounting bracket from the AP by inserting a small-pointed instrument or a paperclip into the **Unlock** hole on the AP as shown in Figure 10 below.

Caution: Use a small-pointed instrument or a paperclip to unlock the AP. Do not use a screwdriver because it may cause damage to the AP lock mechanism or electronic components. Do not use excessive force when inserting a tool into the **Unlock** or **Lock** hole.

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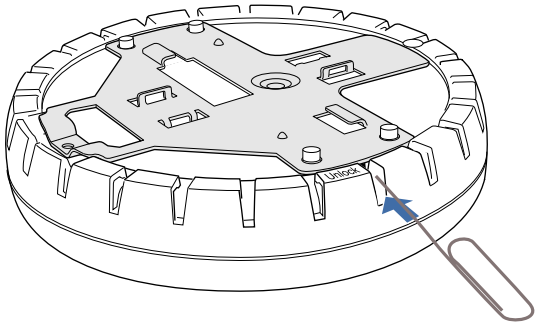
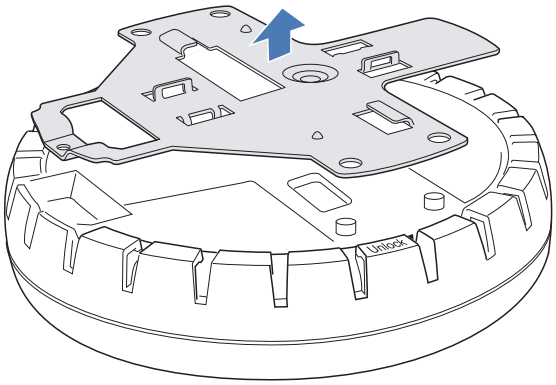
Figure 10: Step 4—Unlocking the Bracket



5. Remove the bracket as shown in Figure 11 below.

Figure 11: Step 5—Removing the Bracket



6. Install the universal mounting bracket as follows onto the T-bar clamp:
   a. As shown in Figure 12, place the universal mounting bracket against the T-bar clamp so that the two screw holes face downward and the two T-bar flanges face upward and are adjacent to the T-bar edges.
   b. Properly align the bracket for mounting by placing the bracket so that the port connector opening is to the left of the hole you cut for the cables.
   c. Rotate the universal mounting bracket clockwise until the flanges snap into place on the T-bar clamp as shown below.

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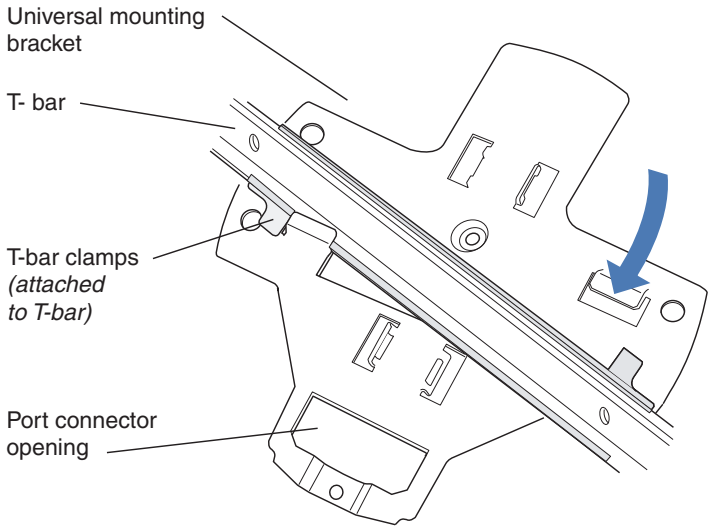
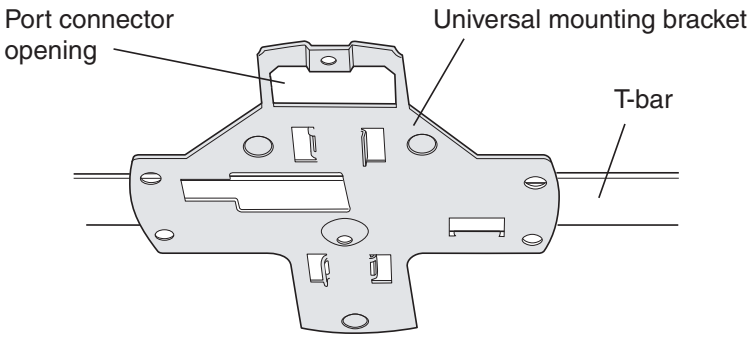
Figure 12: Step 6—Top View



(Viewed from above ceiling tiles, looking down.)

Figure 13: Step 6—Bottom View



7. Pull the Cat 5 cable about 15 centimeters (about 6 inches) out of the hole in the ceiling tile and through the port connector opening to create enough slack to insert the cable.
8. Insert the Cat 5 cable into the connector.
9. Install the Kensington lock, if you plan to use one.
    a. Loop the Kensington lock cable around an object that cannot be moved or damaged by a person pulling on the cable.
    b. Insert the key into the Kensington lock.
    c. Insert the Kensington lock into the security slot on the AP.
    d. Rotate the key right or left to secure the lock to the AP.
    e. Pull on the lock to verify that it is secured to the AP.
    f. Remove the key.

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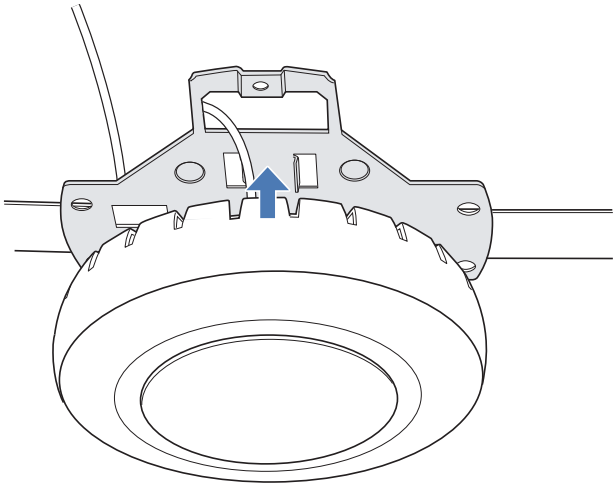
10. Lift the AP into place on the universal mounting bracket as shown in Figure 14. Make sure the cable feeds properly into the ceiling as you lift the device, and does not become trapped between the AP and the bracket.

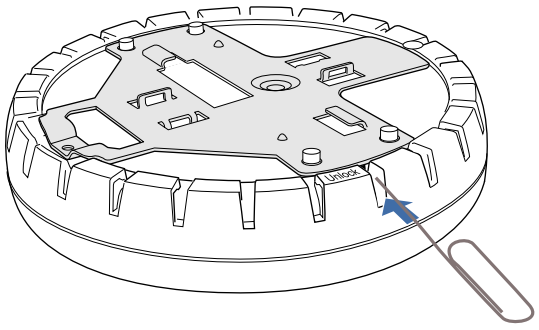
Figure 14: Step 9—Placing the AP on the Bracket



11. Lock the AP onto the bracket by inserting a small-pointed instrument or a paperclip into the **Lock** hole on the AP as shown in Figure 15 below.

Warning: To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

Figure 15: Step 10—Locking the Bracket



12. To ensure that the AP is fully locked onto the bracket, gently pull down on the AP and attempt to rotate it from side to side.
13. If the AP comes off the bracket, relock the device onto the bracket.
14. If the AP requires an external antenna, install and connect the antenna.

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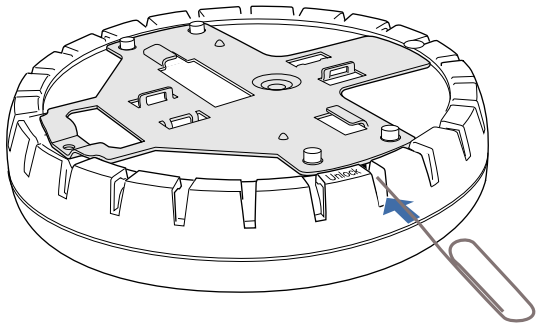
Junction Box Installation

1. Unlock the universal mounting bracket from the AP by inserting a small-pointed instrument or a paperclip into the **Unlock** hole on the AP as shown in Figure 16.

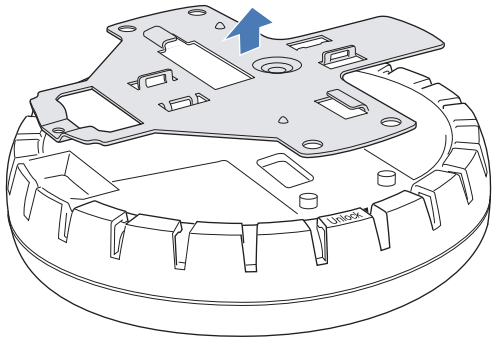
> Warning: Use a lock/unlock tool to unlock the AP. Do not use a screwdriver because it may cause damage to the AP lock mechanism or electronic components. Do not use excessive force when inserting a tool into the **Unlock** or **Lock** hole.

Figure 16: Step 1—Unlocking the Bracket



2. Remove the bracket as shown in Figure 17.

Figure 17: Step 2—Removing the Bracket



3. Attach the universal mounting bracket to the junction box as shown in Figure 18:
   a. Place the universal mounting bracket against the junction box so that the two screw holes face the junction box and align over the screw holes in the box.
   b. Insert the #6-32 x 1-inch machine screws in the universal mounting bracket screw holes, and use a #2 Phillips-head screwdriver to tighten them.

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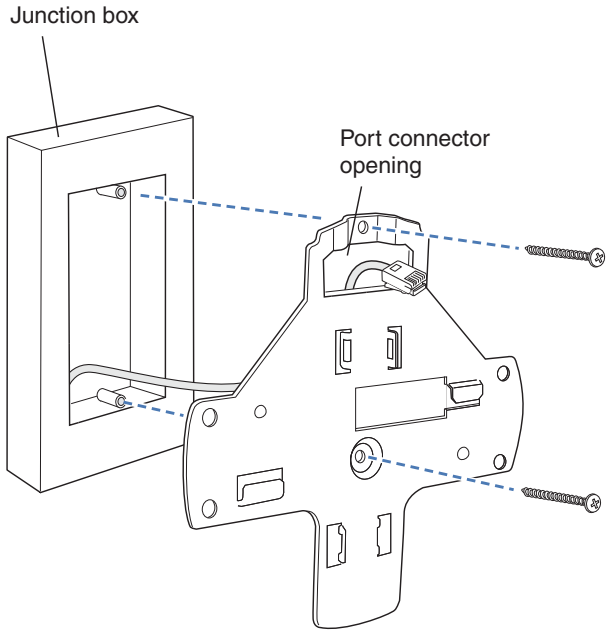
Figure 18: Step 3—Placing the Bracket on the Junction Box



4. Pull the Cat 5 cable about 15 centimeters (about 6 inches) out of the junction box and through the port connector opening to create enough slack to insert the cable into the port connectors.
5. Insert the Cat 5 cable into the connector.
6. Install the Kensington lock, if you plan to use one.
   a. Loop the Kensington lock cable around an object that cannot be moved or damaged by a person pulling on the cable.
   b. Insert the key into the Kensington lock.
   c. Insert the Kensington lock into the security slot on the AP.
   d. Rotate the key right or left to secure the lock to the AP.
   e. Pull on the lock to verify that it is secured to the AP.
   f. Remove the key.
7. Lift the AP into place on the universal mounting bracket. Make sure the cable feeds properly into the junction box as you lift the device, and does not become trapped between the AP and the bracket.
8. Lock the AP onto the bracket by inserting a small-pointed instrument or a paperclip into the **Lock** hole on the AP as shown in Figure 19.

Warning: To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

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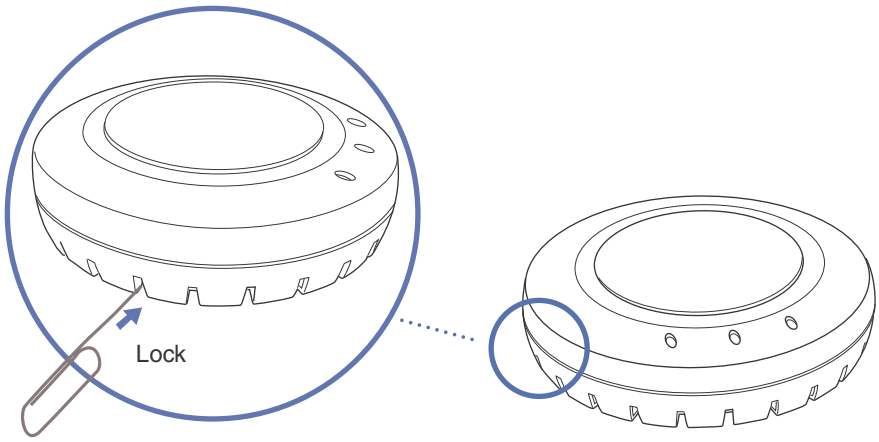
Figure 19: Step 7—Locking the Bracket



9. To ensure that the AP is fully locked onto the bracket, gently pull down on the AP and attempt to rotate it from side to side.
10. If the AP comes off the bracket, relock the device onto the bracket.
11. If the AP requires an external antenna, install and connect the antenna.

Solid Wall or Ceiling Installation

Informational Note: The solid surface mounting option requires Cat 5 cable that does not have strain relief, unless you plan to route the cable through a hole in the wall or ceiling. The other options can use Cat 5 cable with or without strain relief.

1. Prepare holes in the wall or ceiling for the universal mounting bracket, using the following steps:
   a. Place the paper mounting template over the location to install the AP.
   b. Mark the screw hole location(s).
   c. If you plan to route the Cat 5 cable externally along the wall or ceiling, mark the locations of both the center screw hole and the screw hole by the port connector opening.
   d. If you plan to route the Cat 5 cable through a hole in the wall or ceiling, mark the location of the center screw hole only. You cannot use the screw hole by the port connector opening if you cut a hole for the opening.

   Informational Note: Do not mark the four holes on the edges of the bracket. The AP fits into these holes. They are not screw holes.

   e. Remove the template.
2. Install the drywall anchor(s):
   a. Hammer a drywall anchor into each hole, up to the beginning of the threads on the anchor.
   b. Screw each anchor the rest of the way into the hole using a #2 Phillips-head screwdriver.

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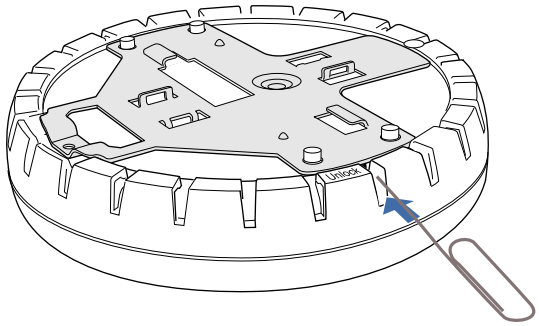
c. Remove the screw from each anchor and save the screw(s) for step 6.

3. Unlock the universal mounting bracket from the AP by inserting the lock/unlock tool into the **Unlock** hole on the AP as shown below.

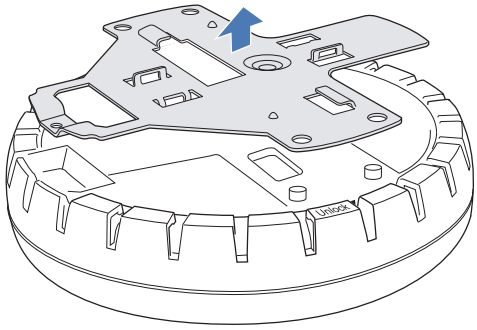
Caution: Use the lock/unlock tool to unlock the AP. Do not use a screwdriver because it may cause damage to the AP lock mechanism or electronic components. Do not use excessive force when inserting a tool into the **Unlock** or **Lock** hole.

Figure 20: Step 3—Unlocking the Bracket



4. Remove the bracket as shown in Figure 21.

Figure 21: Step 4—Removing the Bracket



5. As shown in Figure 22, feed the Cat 5 cable through the port connector opening and align the universal mounting bracket over the drywall anchors so that the two screw holes in the bracket face the drywall anchors.

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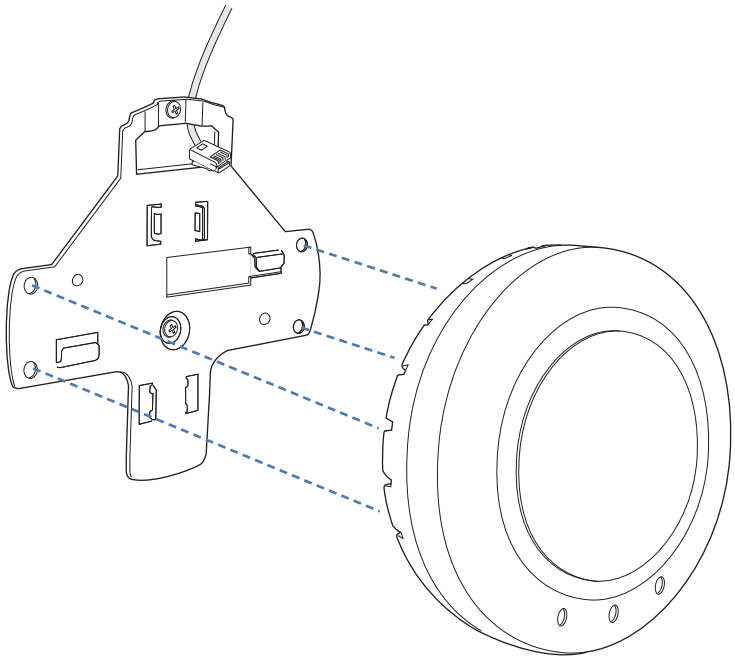
6. Insert the #6 sheet metal screws into the screw holes, and tighten them to secure the universal mounting bracket to the wall or ceiling. If you routed the Cat 5 cable through a hole in the wall or ceiling, insert the screw into the center screw hole only.

> Informational Note: Do not insert screws in the four holes on the edges of the bracket. The AP fits into these holes. They are not screw holes

Figure 22: Steps 5 and 6—Bracket Placement on Solid Wall or Ceiling



7. Insert the Cat 5 cable into the connector.
8. Install the Kensington lock, if you plan to use one.
   a. Loop the Kensington lock cable around an object that cannot be moved or damaged by a person pulling on the cable.
   b. Insert the key into the Kensington lock.
   c. Insert the Kensington lock into the security slot on the AP.
   d. Rotate the key right or left to secure the lock to the AP.
   e. Pull on the lock to verify that it is secured to the AP.
   f. Remove the key.
9. As shown in Figure 23, place the AP on the bracket, making sure to remove any slack that occurs in the cable between the bracket and the AP.

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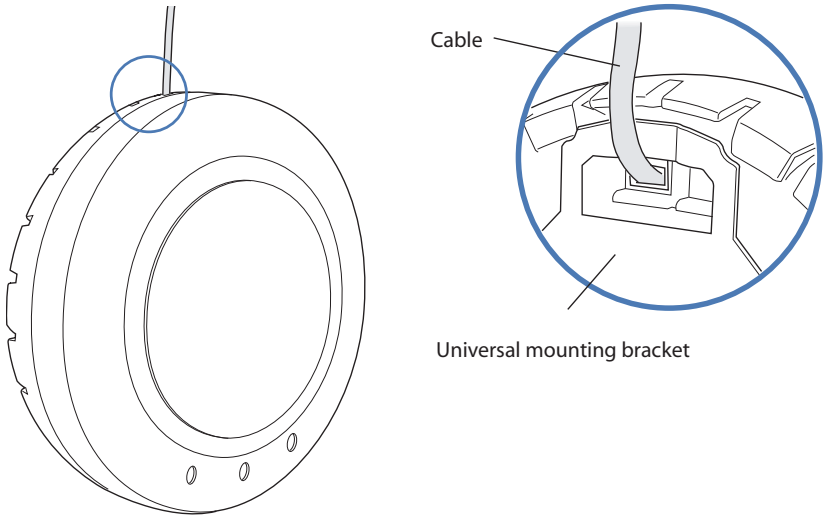
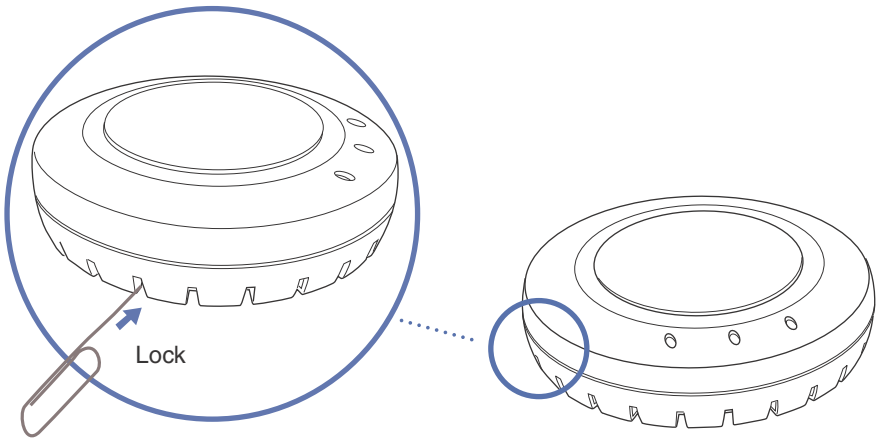
Figure 23: Step 8—Cable Placement



10. Lock the AP onto the bracket by inserting the lock/unlock tool into the **Lock** hole on the AP as shown below.

Warning: To prevent possible damage to the AP, make sure the device is fully locked onto the bracket before releasing it.

Figure 24: Step 9—Locking the Bracket



11. To ensure that the AP is fully locked onto the bracket, gently pull on the AP and attempt to rotate it from side to side.
12. If the AP comes off the bracket, relock the device onto the bracket.
13. If the AP requires an external antenna, install and connect the antenna.

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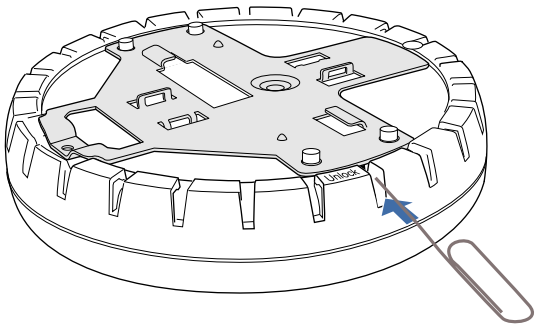
Tabletop Installation

1. Reverse the universal mounting bracket:

   a. Unlock the universal mounting bracket from the AP by inserting the lock/unlock tool into the Unlock hole on the AP as shown in Figure 25 below.

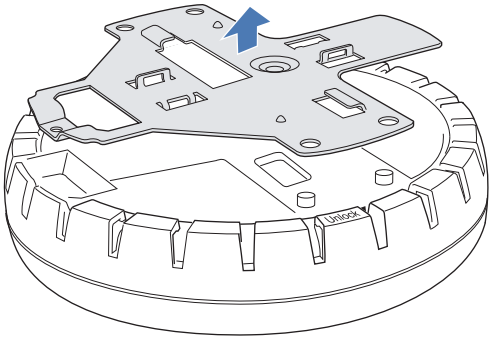
> Caution: Use the lock/unlock tool to unlock the AP. Do not use a screwdriver because it may cause damage to the AP lock mechanism or electronic components. Do not use excessive force when inserting a tool into the **Unlock** or **Lock** hole.

Figure 25: Step 1a—Unlocking the Bracket



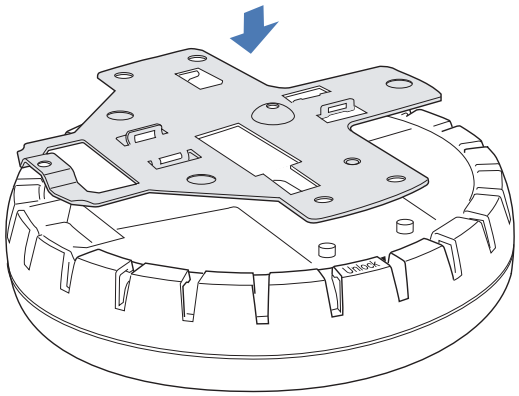
   b. Remove the bracket as shown in Figure 26 below.

Figure 26: Step 1b—Removing the Bracket



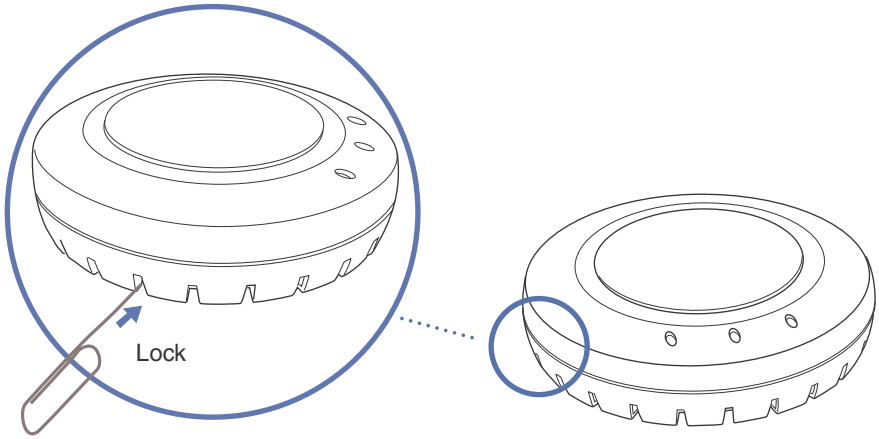
   c. Turn over the universal mounting bracket, then align the bracket over the cable ports and the four mounting posts as shown in Figure 27 below.

Figure 27: Step 1c—Turning Over the Bracket



d. Once the bracket is fully seated, lock the bracket onto the AP by inserting the lock/unlock tool into the **Lock** hole on the AP as shown in Figure 28 below.

Figure 28: Step 1d—Locking the Bracket



2. Insert the Cat 5 cable into the connector.
3. Install the Kensington lock, if you plan to use one.
   a. Loop the Kensington lock cable around an object that cannot be moved or damaged by a person pulling on the cable.
   b. Insert the key into the Kensington lock.
   c. Insert the Kensington lock into the security slot on the AP.
   d. Rotate the key right or left to secure the lock to the AP.
   e. Pull on the lock to verify that it is secured to the AP.
   f. Remove the key.
4. Place the AP in the desired location on the table.
5. If the AP requires an external antenna, install and connect the antenna.

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Connecting an AP to an External Antenna

Each radio on an Indoor AP can use an optional Juniper Networks external antenna. To mount the antenna, see the instructions that come with the antenna.

To connect a mounted external antenna to an AP:

1. Attach the exterior antenna cable that is shipped with the antenna to the AP external antenna connector.

Both connectors are labeled to indicate the radio type. The AP has RP-SMA connectors for attachment to the 802.11b/g antenna and to the 802.11a antenna.

Caution: The external connectors on the AP are labeled: 11B/G and 11A (excluding the WLA522E which has numbered ports only). Each connector is a RP-SMA connector. Make sure you attach the antenna to the correct connector.

Informational Note: If the AP is installed in a Juniper Networks outdoor AP enclosure, attach the antenna cable to the lightning surge arrestor (if installed) or the RP-SMA bulkhead connector on the enclosure.

2. Attach the other end of the antenna cable to the antenna.

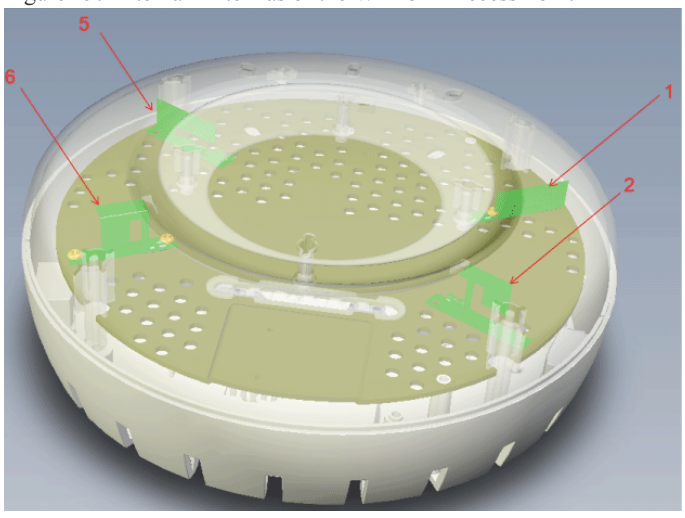
Radiation Patterns of Internal Antennas for 2.4-GHz and 5-GHz Radios in the WLA522 Access Point

The WLA522 access point has four internal, multiple-input multiple-output (MIMO) antennas, with two antennas for each of the access point's two radios. The antennas support spatial and pattern diversity as well as cross-chain and cross-band isolations for maximum performance. The antennas provide a maximum gain of 3.4-dBi at 2.4GHz throughput and 5.6-dBi at 5GHz throughput.

This topic provides graphical depictions of radiation patterns for the internal antennas. The graphics display relative field strengths of signals transmitted from or received by the antennas. You can use this radiation pattern information to determine the distance between access point and client and also where to place the access points.

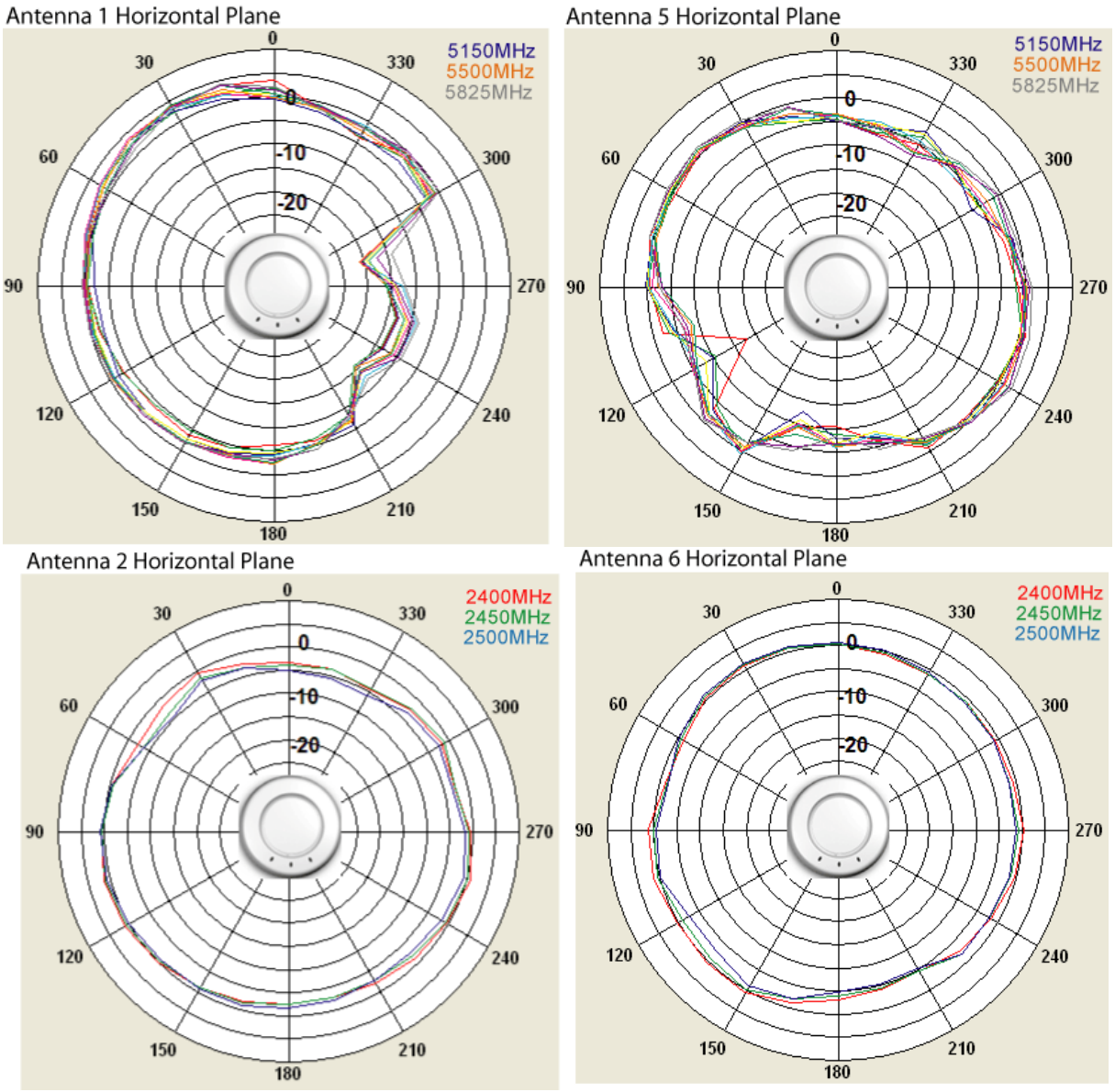
The figure below shows the locations of the four internal antennas within the WLA522. The antennas are numbered 1 and 5 for 5GHz elements and 2 and 6 for 2.4GHz elements.

Figure 29: Internal Antennas of the WLA522 Access Point



The figure below shows the horizontal-plane radiation patterns for the access point. The pattern provides even and complete 360-degree coverage by the antenna elements.

Figure 30: Horizontal-Plane Radiation Patterns (Omni-directional) for a Ceiling-Mounted WLA522 Access Point.



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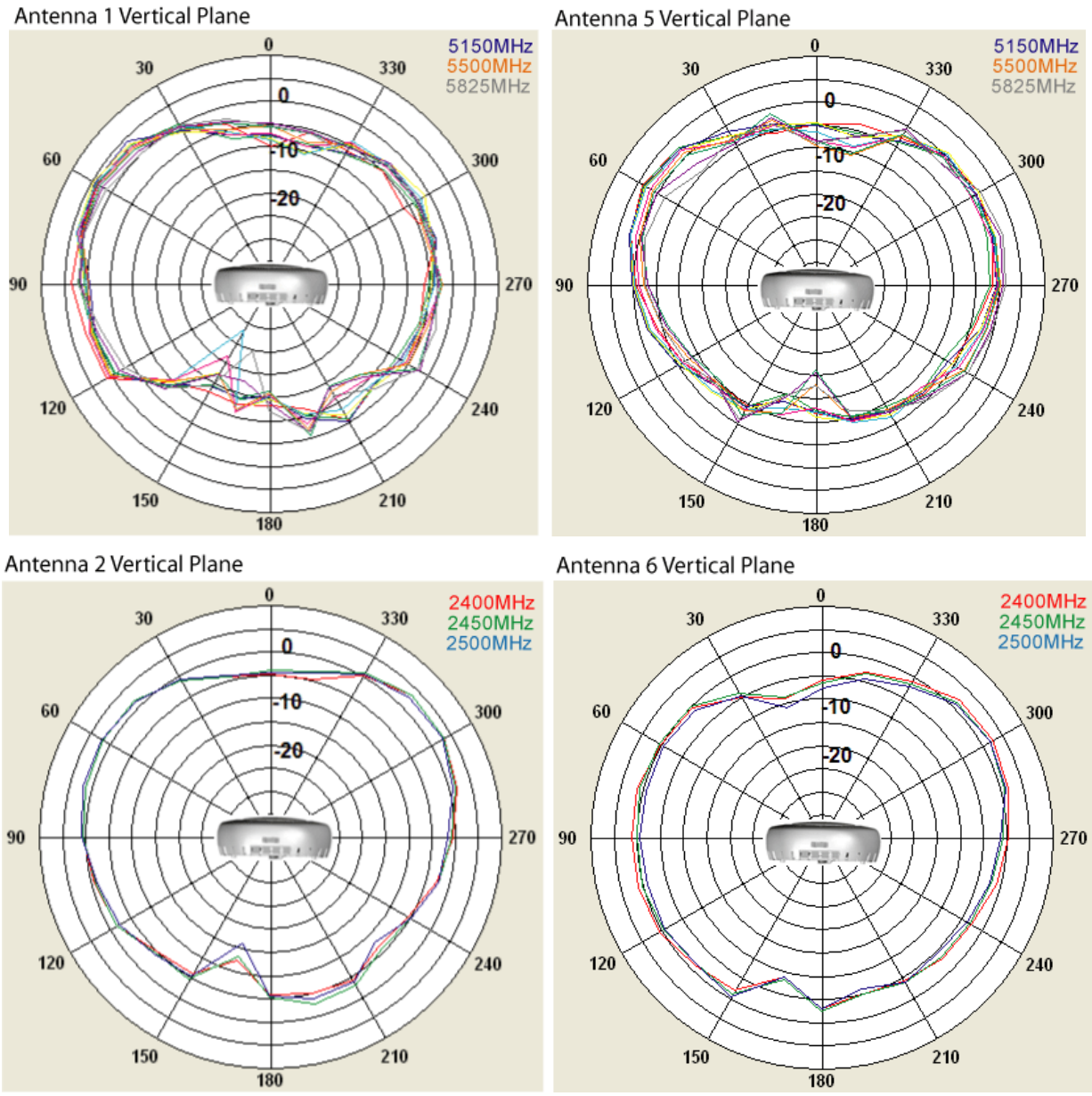
The figure below shows the inverted vertical plane radiation patterns for the access point. The pattern provides maximum antenna gains along the outer edges of the access point with a 30-degree downtilt.

Figure 31: The Inverted (Pointing at the Ground at a 0-Degree Angle) Vertical-Plane Radiation Patterns for a Ceiling-Mounted WLA522 Access Point.



Installing an Indoor WLA522E Access Point

The WLA522E installation steps for ceiling or wall mount are the same as the WLA522 except that you must install and orient the four antennas on the AP before supplying power to the unit. The WLA522E has no internal antennas and requires antennas for all types of operation. Once the AP is installed on either the wall or ceiling with antennas attached you can switch between Radio 1 and 2 using the CLI command:

```
set ap # radio x mode disable
```

Warning: Always install the four WLA522E antennas before supplying power to the AP. Failure to do so can cause damage to the unit.

Warning: The tested/certified antennas are equipped with Reverse-SMA or N-type jacks.

Warning: This device and its antenna(s) must not be co-located or operated in conjunction with any other antenna or transmitter.

Warning: The external connectors on the WLA522E are labeled 1, 2, 3, 6 on the housing. Each connector is a RP-SMA connector. Make sure you attach the antenna to the correct connector.

Warning: For products available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

Warning: This device is going to be operated in 5.15~5.25GHz frequency range, it is restricted in indoor environment only.

WLA522E Installation Antenna Orientation

Adjust the WLA522E antennas as shown below for optimal polarization.

Warning: Always turn the paddle antenna clockwise while adjusting the antenna orientation in order to prevent loosening of the connector.

Figure 32: Wall Mount

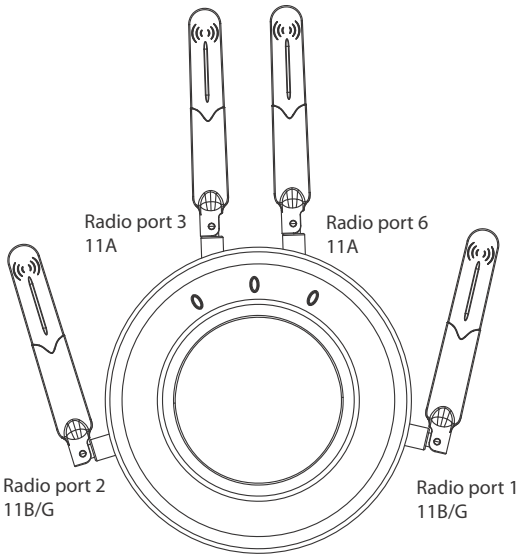


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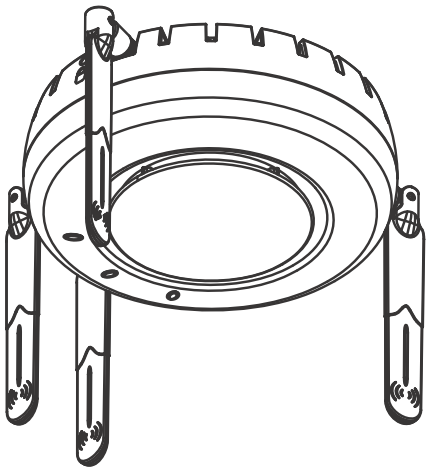
Figure 33: Ceiling Mount



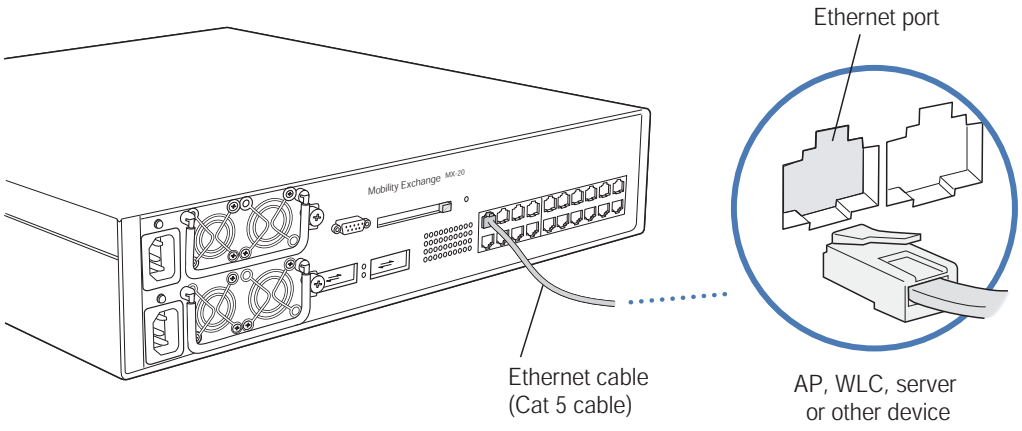
Connecting an AP to an WLC

You can connect an AP directly to an WLC or indirectly to the WLC through an intermediate Layer 2 or Layer 3 network. If you are connecting the AP directly to an WLC, use the following procedure to insert the cable into the WLC and verify the link.

You can use the CLI or RingMaster to configure an AP connection. If you are installing the AP as a Mesh AP in a WLAN Mesh or wireless bridge configuration, you must configure the AP connection before deploying the AP in the final location. (See the Mobility System Software Configuration Guide.)

Figure 31 below shows how to insert a Cat 5 cable into 10/100 Ethernet port on an WLC. Refer to this figure as you perform the procedure.

Figure 34: 10/100 Cat 5 Cable Installation



1. Insert a Cat 5 cable with a standard RJ-45 connector. For connection to an AP, use a straight-through cable.

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2. When the link is activated, observe the AP LED for the port on the WLC.

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Configuring the AP

To configure the channels, power settings, and other AP parameters, see the following guide:

- Juniper Networks Mobility System Software Quick Start Guide

External Antenna Connectors

Table 3 below lists the Juniper Networks-supported WLA522E external antenna models.

Table 3: Juniper Networks External Antenna Models WLA522E

Model	Description
WLA-ANT5007-OUT	Outdoor two-element cross-polarized high-gain directional panel antenna for 11n 5 GHz band.
WLA-ANT7360A-OUT	360° outdoor dual-band omni-directional antenna with 6 dB (8 dB) gain in the 2.4 GHz (5 GHz) band; includes mast mounting kit and 36” Type N male to Type N male low-loss cable.
WLA-ANT74520-OUT	Indoor/outdoor dual-band three-element directional panel antenna for 11n. 10.9 dB (13.5 dB) gain in the 2.4 GHz (5 GHz) band and 45 degree (20 degree) horizontal beamwidth in the 2.4 GHz (5 GHz) band.
WLA-ANT77555-OUT	Indoor/outdoor dual-band three-element directional panel antenna for 11n, 8 dB (10.7 dB) gain in the 2.4 GHz (5 GHz) band and 75 degree (55 degree) horizontal beamwidth in the 2.4 GHz (5 Hz) band.
WLA-ANTXTEND-OUT	12" Belden 7806A cable (LMR-195) with N-female and RP-SMA plug connectors for extending WLA522E coaxial interface for use with external antennas.

Informational Note: The Indoor AP radios are certified for use only with these external antennas.

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